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RADER, FISHMAN & GRAUER PLLC
39533 WOODWARD AVENUE
SUITE 140
BLOOMFIELD HILLS, MI 48304-0610

EXAMINER

SHARP, JEFFREY ANDREW

ART UNIT	PAPER NUMBER
3677	

DATE MAILED: 02/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/708,928

Applicant(s)

HINSON ET AL.

Examiner

Jeffrey Sharp

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Status of Claims

- [1] Claims 1-5 are pending.

Drawings

- [2] The drawings are objected to because:

Figure 1 does not show '*a fastener assembly 10*' mentioned in paragraphs [0012], [0017], and [0020].

Figure 1 does not show '*a threaded bore 22*' mentioned in paragraphs [0012] and [0013].

Figure 1 does not show '*an aperture 24*' mentioned in paragraph [0012].

Figures 3 and 4 do not have x or y-axis labels.

Figure 5 does not clearly show '*Spring*' data. The legend marking for '*Spring*' is not visible. It appears a white or light-colored line has been photocopied.

Figure 5 does not have x or y-axis labels.

Figure 6 does not clearly show '*cover w/ grommet*' data. The legend marking for '*cover w/ grommet*' is not visible. It appears a white or light-colored line has been photocopied.

Figure 6 does not have a y-axis label.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing

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sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

[3] The disclosure is objected to because of the following informalities:

Two reference numerals '26' and '36' are used for the same element '*circumferential necking*' in paragraph [0014].

The word --of-- should be inserted after '*The upper end*' on the first line of paragraph [0015].

It appears the word '*over*' on lines 14 and 15 of paragraph [0017] should be --oven--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

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- [4] The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

- [5] Claim 1 rejected under 35 U.S.C. 102(b) as being anticipated by Futamura US-4,118,041.

Futamura teaches a fastener assembly comprising: a fastener (23) having a head portion (24), retention sleeve (10) disposed about the threaded fastener (23), and a wave spring (11) disposed about the retention sleeve (10). See Col 1. lines 33-35, and Col 4 lines 22-35.

Futamura teaches that the implementation of a spring-type washer element (11) underneath the head portion (24) of the fastener (23) ensures that the seal (6) between a valve cover (3) or the like and an engine block (1) will not be over compressed, and thus, prevents premature failure of the seal. Futamura expressly discloses that it would be obvious to employ 'conventional auxiliary elements', including a spring washer.

- [6] Claim 1 rejected under 35 U.S.C. 102(b) as being anticipated by Lindow US-4,571,133.



Lindow teaches a fastener assembly comprising: a fastener (11) having a head portion (16), retention sleeve (20,21) disposed about the threaded fastener (11), and a wave spring (22) disposed about the retention sleeve (20,21).

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[7] Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Kammerer et al. US-5,655,489.

Kammerer et al. teach a fastener assembly comprising: a fastener (4) having a head portion and radially projecting collar (Figure 3, Col 2 lines 53-55), retention sleeve (9) disposed about the threaded fastener (4), and a wave spring (5) disposed about the retention sleeve (9).

The limitation '*disposed about*' (claim 1 line 7) has not been limited to --touching-- or --contacting-- or --abutting--. The term '*about*' may be considered as generally broad in nature.

a·bout   Pronunciation Key (ə·bout')
prep.

1. On all sides of; surrounding: *I found an English garden all about me.*
2. In the vicinity of; around: *explored the rivers and streams about the estate.*
3. Almost the same as; close to; near.

[8] Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Penn et al. US-4,456,268. See Col 1 lines 51-64.

Claim Rejections - 35 USC § 103

[9] The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[10] Claims 1, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futamura US-4,118,041 in view of Lindow US-4,571,133 and Greenhill US-4,752,178.

Futamura teaches a fastener assembly comprising: a fastener (23) having a head portion (24), retention sleeve (10) disposed about the threaded fastener (23), and a wave spring (11) disposed about the retention sleeve (10). The assembly is meant to join a valve cover (3) or the like to an engine block (1). Futamura essentially teaches that a spring (11) under the head portion (24) of a fastener (23) can replace conventional rubber washers/grommets if it is desired to do so.

However, Futamura fails to disclose expressly using the wave washer substantially shown and disclosed by Applicant (shown in the drawings) as a substitute for the spring (11) mounted underneath the head portion (24) of the fastener (23).

Lindow suggests using an undulating wave spring (22) having peaks and troughs between a valve cover (12) and head portion (16) of a threaded fastener (11) to better secure the cover (12) to the head of an engine while providing better 'decoupling' the cover from the block (see also, Penn et al. US-4,456,268 for support). Lindow suggests the wave spring washer (e.g., Belleville washer, conical spring, etc.) in place of an elastomeric washer, due to its ability to *'maintain the gasket in sealing relationship against either the rocker arm cover or the cylinder head, or both'*. See Lindow Col 1 lines 17-34.

Greenhill (refer to Figures 1 and 2) shows a well-known prior art wave spring. The spring is adapted to fit snugly around a cylindrical surface (35) and be maintained under a flange portion (29). This reference is used only to indicate the structure of the wave spring disclosed by

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Applicant in the submitted Figure 2. Futamura and Lindow do not teach away from using spring washers of various wave configurations.

The '*retention member*' (i.e., bushing, washer, standoff) substantially disclosed by Applicant (e.g., '*radially outwardly projecting head flange*') in combination with a valve cover screw or the like is old and well-known. Note that in most applications, this member can be made integral with the threaded fastener as a common standoff/shoulder bolt. A few examples of prior art retention members having flanged heads are shown in the following references:

US-6,591,801, numeral 36

US-4,732,519, numeral 14

US-6,347,694, numeral 24

US-5,397,206, numeral 26

US-6,227,784, numeral 28

US-5,513,603, numeral 54

US-3,687,184, numeral 28

US-4,345,552, Figure 10, Col 8 lines 46-60

At the time of invention, it would have been obvious to one of ordinary skill in the art, to provide a radially-outwardly projecting head flange on the retention member, as it is customary in the art to provide a headed or flanged 'standoff bushing'-type element around a headed threaded fastener in applications that require joining a valve cover to an engine head. This is demonstrated by the aforementioned supporting references. '*Retention members*' have multiple uses and advantages including load displacement, tolerance compensation, thermal compensation, means for sealing, means for hole alignment, standoff means for facilitating some

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small axial displacement of the valve cover upon vibration, etc. A flanged head on the retaining member would provide more surface area and thus, an improved load distribution on the resilient wave spring underneath, and would function similarly to the flanges taught by the prior art (with elastomeric elements instead of spring washers or the like). Refer to the non-cited pertinent references listed below in the conclusion of this Office Action.

At the time of invention, it would have also been obvious to one of ordinary skill in the art, to make the fastener, retention sleeve, and wave spring from a metallic material, because it would be readily understood and appreciated by those of ordinary skill in the art, to make the three fastening components of similar material to: 1) achieve even part wear, 2) reduce creep between dissimilar parts, 3) keep the thermal coefficients close in value, etc. It is further inherent to those of ordinary skill in the art that bolts, retention members (e.g., washers, standoffs, bushings), and wave springs are all made of metal. Kasting et al. US-4,345,552 supports a 'steel' retention member 152 in Col 8 line 50. Lindow '133 and Greenhill '178 show metal 'wire' wave springs. Note that it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious engineering design choice. *In re Leshin*, 125 USPQ 416. It is also common knowledge to choose a material that has sufficient strength, durability, flexibility, hardness, etc. for the application and intended use of that material. In the instant case, metal would be an obvious material of choice, as engines must endure heat and cyclic loading from vibration.

[11] Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Penn et al. US-4,456,268 in view of Seymour II, et al. US-2004/0159310A1 and Greenhill US-4,752,178.

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Penn et al. teach maintaining even gasket compressive loading through the use of wave springs (resilient means 17, claim 2) positioned between the head portion (16) of a threaded fastener (10) and valve cover, in order to reduce friction between the bolt head and valve cover while tightening the bolt. This ensures better control over bolt torque and thus evenly compresses the gasket (18) to create an improved seal between the engine block and the valve cover. See Col 1 lines 9-14, lines 51-64. The fact that Penn et al. uses a standoff/shoulder bolt, instead of a separate '*retention sleeve*' (i.e., standoff-type bushing portion known in the art) is irrelevant to the scope of Applicant's disclosure. It would have been an obvious matter of design choice to use a separate sleeve member as shown in the prior art, in lieu of a one-piece shoulder bolt, as Applicant has not disclosed that it solves any stated problem of the prior art or is for any particular purpose. Further, it appears that the invention would perform equally well as the invention disclosed by Penn et al. Clearly, Applicant shows the retention sleeve to be integral with the threaded fastener via a lower threaded portion. Note that it has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179.

Seymour II et al. substantially disclose in Figure 5 and claim 4, that wavy spring washers and their equivalents may be used in automotive engine fastening applications

It would not be unobvious to interchange or substitute any suitable Belleville washer, spring washer, wave spring, leaf spring etc. for the resilient biasing means shown by Penn et al., as wave springs are commonly used in automotive applications where compensation due to vibration and thermal expansion is needed. A prior art wave spring such as that disclosed by Greenhill '178, would provide the same smooth rotational bearing surface and axial biasing force

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shown by Penn et al., and function similarly against a fastener head or retention device upon tightening. The abovementioned Lindow '133 reference expressly makes the combination of a threaded fastener having a head and a wave spring in valve cover fastening assemblies.

[12] Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sihon US-5,397,206 in view of Penn et al. US-4,456,268 and Seymour II et al. US-2004/0159310A1.

Sihon teaches a fastener assembly comprising: a threaded fastener (20) having a head portion (24) with a radially-projecting collar, and a retention sleeve (26) disposed about the fastener having a radially outwardly projecting head flange (34,36).

Sihon does not disclose a spring substitute for the elastomeric grommet (28) to provide an alternative means for vibration isolation (i.e., 'acoustic decouplement').

Penn et al. suggest a plurality of spring means (17) comprising Belleville washers used under the fastener head as an alternative to the elastomeric grommets of the prior art. The spring means (17) disclosed by Penn et al. advantageously have improved friction-reducing characteristics over the elastomeric damping element taught by Sihon, which facilitate smaller torque tolerances.

Seymour II et al. suggest that within the art, Belleville washers, spring washers, and wave springs are considered equivalent alternatives. See paragraph [0027], Figure 5, and claim 4.

At the time of invention, it would have been obvious to one having ordinary skill in the art, to substitute the elastic element in the fastener assembly taught by Sihon, with any type of spring washer, Belleville washer, or wave spring washer as suggested by Penn et al. and Seymour II et al., in order to maintain acoustic decouplement of a valve cover with an engine

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block, while providing an improved low-frictional torque-bearing surface against the retention device and fastener head. A lower friction wave spring substitute has been shown by the prior art to: 1) eliminate elastomeric creep problems, 2) even out compressive loads between the valve cover and engine block, and 3) more tightly control bolt torque.

Conclusion

[13] The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows:

US-5,655,489 teaches an 'acoustically uncoupled valve cover' fastening assembly comprising disc springs.

US-5,934,232 Figure 3, element 56.

US 0361298 A	USPAT	Kilmer
US 0491173 A	USPAT	Hayward
US 20030042689 A1	US-PGPUB	Diez, Armin et al.
US 20030154957 A1	US-PGPUB	Subramanian, Viswanathan et al.
US 20040113370 A1	US-PGPUB	Beutter, Ulrich et al.
US 20040118383 A1	US-PGPUB	Gould, DeForest C. et al.
US 20040118388 A1	US-PGPUB	Geiger, Steffen et al.
US 2255217 A	USPAT	HILL HENRY C
US 2456572 A	USPAT	GEORGE WAGSTAFF
US 2798748 A	USPAT	ALBRECHT MAURER
US 2893717 A	USPAT	SIMMONS ARTHUR B
US 2930605 A	USPAT	STEWART HOWARD J
US 2951674 A	USPAT	RICE LYMAN A
US 2982323 A	USPAT	KARL VOSSLOH FRIEDRICH et al.
US 3021129 A	USPAT	MAKER JAMES H
US 3319508 A	USPAT	MCCORMICK HAROLD E
US 3391910 A	USPAT	PRAHL WALTER H
US 3687184 A	USPAT	Wagner; David P.
US 3805827 A	USPAT	Kennedy; Neal R. et al.
US 3877339 A	USPAT	Muenchinger; Herman G.

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US 3884457 A	USPAT	Leko; Toma D.
US 3953555 A	USPAT	Gley; Paul R.
US 3967829 A	USPAT	Rogers; William A.
US 4027644 A	USPAT	Timour; Sune E.
US 4072081 A	USPAT	Curtis; Gary M. et al.
US 4215664 A	USPAT	Hatz; Ernst
US 4266566 A	USPAT	Kacal; Gary W. et al.
US 4303362 A	USPAT	Lockhart; David A.
US 4345552 A	USPAT	Kasting; Edward W. et al.
US 4667628 A	USPAT	Lopez-Crevillen; Jose M.
US 4732519 A	USPAT	Wagner; David P.
US 4951783 A	USPAT	Kamprath; Axel et al.
US 5020951 A	USPAT	Smith; David G.
US 5022361 A	USPAT	Schut; Jan
US 5094579 A	USPAT	Johnson; H. Thad
US 5168840 A	USPAT	Taxon; Morse N.
US 5195756 A	USPAT	Wachter; William J.
US 5411054 A	USPAT	Overfield; Norbert W.
US 5513603 A	USPAT	Ang; Leoncio C. et al.
US 5560267 A	USPAT	Todd; Kevin B. et al.
US 5588414 A	USPAT	Hrytzak; Bernard J. et al.
US 5618145 A	USPAT	Kuo; Jung-feng
US 5630571 A	USPAT	Kipp; Melvin D. et al.
US 5639074 A	USPAT	Greenhill; Michael et al.
US 5827025 A	USPAT	Henriksen; Arne
US 5876024 A	USPAT	Hain; Harry L.
US 5884594 A	USPAT	Wiehle; David C.
US 5937976 A	USPAT	Grundei; Manfred
US 5961097 A	USPAT	Zimmermann; Daniel E.
US 5984602 A	USPAT	Park; Robert M.
US 6050557 A	USPAT	Shimoseki; Masayoshi
US 6145182 A	USPAT	Mandon; Stephane L.
US 6227784 B1	USPAT	Antoine; Darren B. et al.
US 6250618 B1	USPAT	Greenhill; Michael
US 6318939 B1	USPAT	Avaux; Alain
US 6332509 B1	USPAT	Nishikawa; Kenji et al.
US 6347694 B1	USPAT	Szadkowski; Andrzej et al.
US 6361257 B1	USPAT	Grant; Anthony J.
US 6371073 B1	USPAT	Billimack; James J. et al.
US 6388351 B1	USPAT	Fisher; Lynn Edwin et al.
US 6582172 B2	USPAT	Nickerson; Earl S. et al.
US 6591801 B1	USPAT	Fonville; Carl Eric
US 6758465 B1	USPAT	Greenhill; Mark et al.
US 6827056 B2	USPAT	Cholewczynski; Ludwik

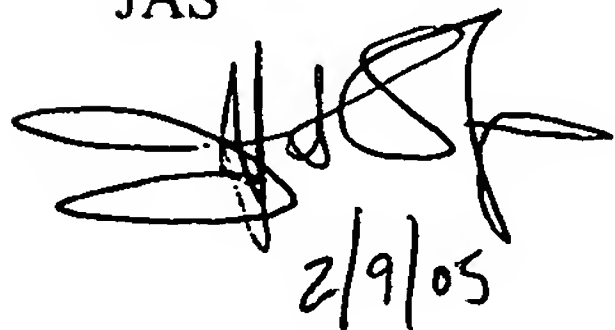
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[14] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Sharp whose telephone number is currently (703) 305-0426, but will change to (571) 272-7074 in April 2005 due to a move to the Alexandria, VA campus. The examiner can normally be reached on 7:30 am - 5:00 pm Mon-Fri.

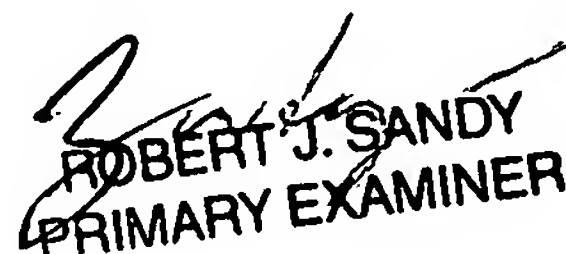
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J.J. Swann can be reached on (703) 306-4115. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JAS



2/9/05



ROBERT J. SANDY
PRIMARY EXAMINER